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$\frac{8}{10}$ ths of an inch. And it is further remarkable in this instance, that the gigantic size attained by *Receptaculites* proceeds less from an extraordinary multiplication of segments, than from such an enormous development of the individual segments as naturally to suggest grave doubts of the character of this fossil, until the exactness of its structural conformity to its comparatively minute recent representative had been worked out.

In a private communication to myself, Dr. Dawson has expressed the belief that *Stromatopora* and several other reputed corals of the Palæozoic series will prove in reality to be gigantic Zoophytic Rhizopods, like *Eozoon* and *Receptaculites*; and I have little doubt that further inquiry will justify this anticipation. Should it prove correct, our ideas of the importance of the Rhizopod type in the earlier periods of geological history will undergo a vast extension; and many questions will arise in regard to its relations to those higher types which it would seem to have anticipated.

In the present state of our knowledge, however, or rather of our ignorance, I think it better to leave all such questions undiscussed, limiting myself to the special object of this communication—the application of my former Researches into the Minute Structure of the Foraminifera, to the determination of the nature and affinities of the oldest type of Organic Life yet known to the geologist.

December 22, 1864.

Dr. WILLIAM ALLEN MILLER, Treasurer and Vice-President,
in the Chair.

The following communications were read :—

- I. "On the Functions of the Fœtal Liver and Intestines." By
ROBERT JAMES LEE, B.A. Cantab., Fellow of the Cambridge
Philosophical Society. Communicated by ROBERT LEE, M.D.
Received November 1, 1864.

(Abstract.)

After some introductory remarks, the author observes that the intestines of the fœtus, between the fifth and ninth months of intra-uterine life, "contain a flocculent substance of orange-pink colour in the duodenal portion, a slimy green substance (the meconium) in their lower portion.

"The nature of the former was ascertained by Dr. Prout to be highly albuminous and nutritious. The nature of the latter, of which Dr. John Davy has given a complete analysis (Trans. Med. Chir. Soc.), is simply excrementitious. In the intermediate portion of the intestine the substance is of intermediate character; the more nutritive its property, the higher its position in the intestine."

He next points out that the mesenteric glands which belong to the

duodenum are most numerous, and that they diminish towards the lower portion of the intestine; so that they are in greatest number where the intestine contains most nutritive substance.

"From this examination," the author continues, "no further proof is required that digestion and absorption are performed, as Harvey believed, during foetal life.

"The origin of the albuminous substance in the intestine was supposed by Harvey to be the liquor amnii, which he attempts to prove is swallowed by the foetus *in utero*.

"In the Bird, as will be seen, the origin of this albuminous substance was ascribed by John Hunter to the yelk-sac.

"In the year 1829 it was shown by Dr. Robert Lee, in a paper published in the Philosophical Transactions, 'On the Functions of the Foetal Liver and Intestines,' that Harvey's explanation was not correct, and that there is satisfactory evidence to prove that the *Liver* is the source of this albuminous substance."

In the foetal bird on the twelfth day of incubation, or later, "the liver is seen to occupy both sides of the abdomen, as in the human foetus. The yelk-sac is seen fixed to the small intestine; the white more than half absorbed. The umbilical vein receives blood from the chorion membrane, in which it has been exposed to the influence of the oxygen of the atmosphere; it receives blood also from the yelk-sac and from the white. So that the nature of the blood in the portal vein of the foetal bird is both highly nutritious and arterial in character.

"The intestines are in the same condition as in the human foetus.

"The origin of the albuminous substance may be ascertained to be from the same organ, namely, from the liver.

"That John Hunter was mistaken in supposing that albumen passed through the vitelline duct (that part of the yelk-sac which is connected with the intestine), is generally allowed; and his supposition may be almost disproved by the fact that it is not possible to inject any fluid into the yelk-sac from the intestine. Besides, Hunter states that it passes through only at the time of hatching, which is not the case, as the intestines are full long before the bird is hatched. The lacteals of the foetal bird cannot be seen.

"To take another class of animals, the Marsupialia. The liver in the foetal kangaroo at the time of birth (that is, in the sixth week of utero-gestation), in the words of Professor Owen, 'consisted of two equal and symmetrically disposed lobes' (Art. 'Marsupialia,' Cyclopæd. Anat. and Physiology). As soon, however, as the mode of life is changed and the umbilical vein closed, the liver begins to diminish in size. Yet there is this resemblance between a Marsupial animal five or six months old, and a human foetus of the same age *in utero*, that, although the source of nutrition is different, yet the intestines are supplied with nutritive substance, and digestion proceeds in both cases alike, the nutritive substance

in one case being derived from the placenta, in the other from the mamma of the mother kangaroo.

“From the foregoing facts certain conclusions may be drawn.

“1. With regard to the placenta.

“Since the organs of the foetal bird are in the same condition as in the human foetus, the nature of the blood supplied to them is probably the same. If so, the umbilical vein of the human foetus contains blood highly nutritious and arterial in character, and therefore the function of the placenta corresponds to that of the chorion membrane, yolk, and white combined; it is in fact the means of absorption, as the veins absorb the yolk and white, and the substitute of the lung in adult life. There is no need of lymphatic vessels in the placenta.

“2. With regard to the liver.

“That the function of this organ is to separate a highly nutritious substance from the blood of the portal vein; and this is true both of the liver of the foetal bird and of the human foetus.

“3. That this albuminous substance is not in a condition to be directly absorbed from the umbilical vein, but is elaborated and separated for absorption by the lacteal vessels.

“4. That there is reason to believe that this function of the liver continues to a great extent during adult life; for the portal vein in that state receives veins which correspond to the umbilical vein in the fact that they proceed from the source of nutrition. That the liver must be actively engaged after the introduction of food into the intestinal canal, and its secretion then more plentiful than at other times.”

II. “Completion of the Preliminary Survey of Spitzbergen, undertaken by the Swedish Government with the view of ascertaining the practicability of the Measurement of an Arc of the Meridian.” In a letter addressed to Major-General SABINE by Captain C. SKOGMAN, of the Royal Swedish Navy: dated Stockholm, Nov. 21, 1864. Communicated by the President. Received December 15, 1864.

“On the receipt of your letter of the 12th of November, I started immediately in quest of Professor Nordenskjöld, to obtain from him the materials for the fulfilment of your wishes in respect to the Spitzbergen Expedition. The Professor, with his usual obliging frankness, at once complied with my request, and communicated to me the Minutes from which I have compiled the subjoined brief Report of his proceedings. You must excuse the hasty manner in which the Report itself, as well as the accompanying map, has been put together, as time presses if my letter has to reach you before your Anniversary on the 30th. The map has no pretensions to exactness, but must be viewed merely in the light of a dia-